# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/954,885 | 09/18/2001 | Rafail Glatman | 0252KR.36115 | 8258 |

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
|---|---|
| 2672 | 3 |

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

| | **Application No.** | | **Applicant(s)** |
|---|---|---|---|
| **Office Action Summary** | 09/954,885 | | GLATMAN, RAFAIL |
| | **Examiner** | | **Art Unit** |
| | Javid A Amini | | 2672 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**.     2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-18* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to. ·

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

| | |
|---|---|
| 1)☒ Notice of References Cited (PTO-892) | 4)☐ Interview Summary (PTO-413) Paper No(s). _____ . |
| 2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5)☐ Notice of Informal Patent Application (PTO-152) |
| 3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6)☐ Other:   . |

## *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7 and 14 rejected under 35 U.S.C. 102(e) as being anticipated by French et al.

1.    Claim 1.

French et al. in abstract teach the step of "A method for modeling visual images and wave propagation", comprising the steps of: French et al. in (col. 15, lines 66-67) teach the step of "(a) describing a scene mathematically"; French et al. in Figs. 3A and 3B illustrate the step of "(b) processing source and receiver information"; The following steps are inherent because: French et al. in (col. 17, lines 5-6) teach the step of "(c) calculating visibility areas"; French et al. in (col. 7, lines 29-32) teach the step of mapping or tracing"(d) tracing wavefronts"; and French et al. in (col. 1, lines 32-40) teach the step of "(e) displaying results".

2.    Claim 2.

French et al. in Figs. 3A and 3B illustrae the step of "The method of claim 1 wherein step (a) further comprises: inputting boundary information for each object in a scene"; French et al. in abstract teach the step of "transforming the boundary information to express boundaries as boundary elements in a desired mathematical representation; determining all boundary elements that are visible from any point on a particular boundary element, for each boundary element"; The following steps are inherent because: French et al. in (col. 8, lines 54-62) teach the step of

"identifying media on opposite sides of a particular boundary element, for each boundary

element; verifying consistency of the identified media; and inputting physical parameters of the

media".

3.      Claim 3.

French et al. in (col. 9, lines 24-30) teach the step of "The method of claim 2 further comprising

the steps of: producing reference tables; and storing in computer memory the reference tables".

4.      Claim 4.

The method of claim 1 wherein step (b) further comprises: inputting a source position for all

sources; inputting a receiver position for all receivers; determining all boundary elements that

are visible from a particular source, for each source; determining all boundary elements that are

visible from a particular receiver, for each receiver; storing in computer memory the

determined boundary elements that are visible from a particular source, for each source; and

storing in computer memory the determined boundary elements that are visible from a particular

receiver, for each receiver. See claims 1 and 2 rejection.

5.      Claim 5.

The following step is inherent because: French et al. in (col. 8, lines 54-62) teach the step of

"The method of claim 4 further comprises the step of verifying media consistency of the

identified boundary elements".

6.      Claim 6.

The following steps are inherent see claims 1-5's rejection "The method of claim 1 wherein step

(c) further comprises: determining visibility limits of all boundary elements that are visible from

any point on a particular boundary element, for each boundary element; determining visibility

limits of all boundary elements that are visible from a particular source, for each source;

determining visibility limits of all boundary elements that are visible from a particular receiver,

for each receiver; eliminating from further processing those portions of all boundary elements

whose visibility is screened by other boundary elements, relative to any point on a particular

boundary element, for each boundary element; eliminating from further processing those

portions of all boundary elements whose visibility is screened by other boundary elements,

relative to a particular source, for each source; eliminating from further processing those

portions of all boundary elements whose visibility is screened by other boundary elements,

relative to a particular receiver, for each receiver; determining visibility borders; subdividing

each visibility range into visibility subranges such that the visibility borders of each visibility

subrange can be represented by a continuous", The following steps are inherent because: French

et al. in (col. 15, lines 55-58) teach the step of "monotonic function with only one type of

curvature; and storing in computer memory the visibility subranges".

7.      Claim 7.

See claim 6's rejection. The method of claim 6 further comprising the step of identifying unique

visibility borders among all remaining portions of all boundary elements.

8.      Claim 14.

French et al. in abstract teach the step of "A method for modeling visual images and wave

propagation, comprising the steps of: French et al. in (col. 15, lines 66-67) teach the step of " (a)

describing a scene mathematically; French et al. in Figs. 3A and 3B illustrate the step of " (b)

processing source and receiver information; The following steps are inherent because: French et

al. in (col. 17, lines 5-6) teach the step of "(c) calculating visibility areas; (d) interpolating front

elements analytically; French et al. in (col. 7, lines 29-32) teach the step of mapping or

tracing"(e) tracing wavefronts; and French et al. in (col. 1, lines 32-40) teach the step of "(f)

displaying results.

### Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9.      Claims 8-13 and 15-18 rejected under 35 U.S.C. 103(a) as being unpatentable over

French et al., and further in view of Shum et al.

10.     Claim 8.

French et al. do not teach the step of "The method of claim 6 further comprising the step of

compressing the visibility limit data stored in computer memory to save memory space",

however Shum et al. in (col. 1, lines 7-12) teach the step of compressing data.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was

made to incorporate the teaching of Shum et al. into French et al. in order to have techniques for

displacement estimation and multi-resolution on the ray path of light. And also by storing data

that is regularly accessed apart from data that is selectively and variably accessed, overall access

speed and efficiency are improved.

11.     Claim 9.

The step is obvious because French et al. in (col. 1, lines 15-19) teach "the step of building

cross-reference tables".

12.    Claim 10.

French et al. in Figs. 3A and 3B illustrate the step of "The method of claim 1 wherein step (d)

further comprises for each source: (i) determining if there are any direct paths between a

particular source and the receivers"; the following steps are inherent because: French et al. in

(col. 17, lines 5-6) teach the step of "(ii) subdividing an initial wavefront emanating from the

particular source into front elements such that a particular front element impinges on a

particular boundary element that is visible from the particular source";  French et al. in abstract

teach the step of "(iii) determining a projection of the particular front element onto the

particular boundary element, for each front element";  French et al. in (col. 7, lines 29-32) teach

the step of "(iv) determining reflected front elements, for each front element;  (v) determining

refracted front elements, for each front element"; the step of "(vi) determining whether any of

the reflected or refracted front elements impinge on any of the receivers"; is obvious because

the signals require to go through the filters, otherwise the signals impinge on any of the

receivers.  The steps of (vii) determining a particular ray path between a particular receiver and

the particular source, for each front element that impinges on any of the receivers;  and (viii)

computing physical parameters based on the particular ray path, for each particular ray path";

are obvious because ray path between a particular receiver and the particular source is

depending on the environment, frequency, amplitude, and etc. The step of "(ix) storing in

computer memory the computed physical parameters"; is obvious because French et al. teach in

Fig. 1 a database. The step of "(x) determining all boundary elements on which the reflected

and refracted front elements emanating from the particular boundary element will impinge, for each front element"; is obvious because French et al. illustrate in Fig. 4 filter path. French et al. do not explicitly specify the step of "(xi) subdividing the reflected and refracted front elements that impinge on more than one boundary element into subdivided front elements such that each subdivided front element impinges on a single boundary element"; however Shum et al. illustrate subdividing the signals (reflected and refracted). The step of "(xii) repeating steps (iii)-(xii) using a particular subdivided front element and its associated boundary element instead of the particular front element and the particular boundary element, for each subdivided front element, until all subdivided front elements are either eliminated or no longer impinge on any boundary", is filtering that French et al. teach in Fig. 4 the filter path.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shum et al. into French et al. in order to have techniques for displacement estimation and multi-resolution on the ray path of light. And also by storing data that is regularly accessed apart from data that is selectively and variably accessed, overall access speed and efficiency are improved.

13.    Claim 11.

The steps of "The method of claim 10 further comprising the steps of: determining whether the reflected front elements or the refracted front elements have less energy than a comparison value, for each reflected front element and each refracted front element; and eliminating from further processing each reflected front element and each refracted front element having less energy than the comparison value" are obvious because a filter or an equation can be set or modify to provide the claim invention.

14.     Claim 12.

The step of "The method of claim 10 further comprising the step of eliminating from further

processing each reflected front element that has undergone a user-defined number of

reflections", is obvious because a filter or an equation or threshold can be set or modify to

provide the claim invention.

15.     Claim 13.

The step of "The method of claim 10 further comprising the steps of: determining a particular

reverse ray path from the particular receiver to the particular source to verify that the particular

reverse ray path terminates within a tolerance value at the particular source, for each of the

particular ray paths; and computing a modified particular reverse ray path for each particular

reverse ray path that does not fall within the tolerance value at the particular source until the

modified particular reverse ray path terminates within the tolerance value at the particular

source", is obvious because a filter or an equation or threshold can be set or modify to provide

the claim invention.

16.     Claim 15.

French et al. in (col. 17, lines 1-11) teach the step of "The method of claim 14 further

comprising the step of determining intensity of a reflection".

17.     Claim 16.

French et al. illustrate in Fig. 4 the step of "The method of claim 15 further comprises the step

of determining shading".

18.     Claim 17.

French et al. illustrate in Fig. 4 the step of "The method of claim 15 further comprises the step

of determining shadowing".

19.     Claim 18.

French et al. in (col. 17, lines 1-11) teach the step of "The method of claim 15 further

comprising the step of determining color".


### *Claim Rejections - 35 USC § 112*


The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making
and using it, in such full, clear; concise, and exact terms as to enable any person skilled in the art to which it
pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
contemplated by the inventor of carrying out his invention.

20.     Claims 6 and 10 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the enablement requirement.  The claim(s) contains subject matter, which was not described in

the specification in such a way as to enable one skilled in the art to which it pertains, or with

which it is most nearly connected, to make and/or use the invention. Because in claims 6 and 10

applicant fails to specify in detail the procedures of the following steps:

> ➢ How does "subdivide an initial wavefront emanating from the particular source into front

> elements such that a particular front element impinges on a particular boundary element

> that is visible from the particular source"?

> ➢ How does "determine a projection of the particular front element onto the particular

> boundary element, for each front element"?

> ➢ How does "determine whether any of the reflected or refracted front elements impinge on

> any of the receivers"?

➢ How does "determine a particular ray path between a particular receiver and the

particular source, for each front element that impinges on any of the receivers"?

➢ How does "compute physical parameters based on the particular ray path, for each

particular ray path"?

➢ How does "determine all boundary elements on which the reflected and refracted front

elements emanating from the particular boundary element will impinge, for each front

element"?

➢ How does "subdivide the reflected and refracted front elements that impinge on more

than one boundary element into subdivided front elements such that each subdivided

front element impinges on a single boundary element"?

➢ How does "a particular subdivided front element and its associated boundary element

instead of the particular front element and the particular boundary element, for each

subdivided front element, until all subdivided front elements are either eliminated or no

longer impinge on any boundary"?

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Javid A Amini whose telephone number is 703-605-4248. The
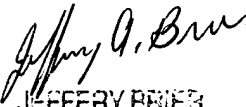
examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Javid A Amini
Examiner
Art Unit 2672

Javid Amini

*Jeffry Q. Brier*

JEFFERY BRIER
PRIMARY EXAMINER